

Missouri Department of Natural Resources
Total Maximum Daily Load Information Sheet

East Fork Locust Creek

Water Body Segment at a Glance:

County:	Sullivan
Nearby Cities:	Milan
Water Body ID:	608
Length of segment:	13 miles
Pollutant:	Bacteria
Source:	Multiple Point and Nonpoint Sources
Water Body ID:	610
Length of segment:	13 miles
Pollutant 1:	Bacteria
Source:	Point and Nonpoint Source
Pollutant 2:	Low Dissolved Oxygen
Source:	Rural Nonpoint Sources



Scheduled for TMDL development: 2013 for bacteria and 2016 for low dissolved oxygen

Description of the Problem

Designated beneficial uses of East Fork Locust Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation – Category B

Uses that are impaired

- Protection of Warm Water Aquatic Life
- Whole Body Contact Recreation – Category B

Standards that apply

- In the Missouri Water Quality Standards, found in 10 CSR 20-7.031 Table A, the criterion for dissolved oxygen, or DO, in streams is a minimum of 5.0 mg/L (milligrams per liter or parts per million).
- The criteria for bacteria are found at 10 CSR 20-7.031(4)(C), where it states that the *E.coli* bacteria count shall not exceed 126 colonies per 100 milliliters of water (126 col/100 mL) for Category A and 206 col/100 mL for Category B waters. This count is the geometric mean during the recreational season (April 1- October 31) in waters designated for whole body contact recreation.

Background information and water quality data

East Fork Locust Creek flows south through the middle of Sullivan County and joins Locust Creek near the county line. Locust Creek is a tributary to It is designated as Category B for the whole body contact recreation use, which means it has places deep enough for total immersion (i.e., swimming), but they may be on private lands or inaccessible to the public. Data used in determining impairment was collected by both the department and MEC Water Resources, Inc.

Water quality conditions in East Fork Locust Creek are not protective of aquatic life. Dissolved oxygen, or DO, is important as many aquatic organisms require high levels of oxygen to survive. For DO, if more than 10 percent of measurements in a water body fail to meet the water quality criterion, that water body is judged to be impaired. In the case of East Fork Locust Creek, DO data were gathered by MEC Water Resources in 2003-04 and the department from 2003-07. Only data collected at sites 1 and 2 showed impairment. At those sites, four of 15 samples (18 percent) did not meet the DO water quality criterion (Figure 1). Thus, only the upper 12.6 miles of segment 610 are judged to be impaired for low DO.

Regarding the bacteria impairment, excessive amounts of fecal bacteria in surface water used for recreation are an indication of an increased risk of pathogen-induced illness to humans. Infections due to pathogen-contaminated waters include gastrointestinal, respiratory, eye, ear, nose, throat and skin diseases. Like fecal coliform, *Escherichia coli*, or *E. coli*, are bacteria found in the intestines of warm blooded animals and are used as indicators of the risk of waterborne disease from pathogenic (disease causing) bacteria or viruses. Most *E. coli* strains are harmless, but some can cause serious illness in humans and are occasionally responsible for product recalls. The harmless strains are part of the normal flora of the intestines, and can benefit their hosts by preventing the establishment of pathogenic bacteria within the intestine^{1,2}. Missouri's bacteria criteria are based on specific levels of risk of acute gastrointestinal illness. The levels of risk correlating to these criteria are no more than eight illnesses per 1,000 swimmers in fresh water.

For the bacteria impairment, the department collected data in 2006-07 from WBID 608 and in 2007 from WBID 610. Fifteen samples were gathered in 2006 and 20 in 2007. The geometric mean of these data exceeded the criteria of 206 col/100 mL for Category B in both segments (Figure 2).

People can protect themselves from waterborne illness by avoiding contact with contaminated water. However, when swimming anywhere, it is wise to take commonsense precautions. These include washing hands before eating, showering after swimming and avoiding exposure to questionable water if you have open cuts or wounds.

The final East Fork Locust Creek TMDL will be based on the most current available data and information. For TMDL status or additional information, please contact the Water Protection Program.

¹ Hudault S, Guignot J, Servin AL (July 2001). "*Escherichia coli* strains colonising the gastrointestinal tract protect germfree mice against *Salmonella typhimurium* infection". *Gut* **49** (1): 47–55

² Reid G, Howard J, Gan BS (September 2001). "Can bacterial interference prevent infection?". *Trends Microbiol.* **9** (9): 424–8.

**Dissolved Oxygen (DO) Data for East Fork Locust Creek -
WBID 610 from 2006 and 2007 at Two Sample Sites**

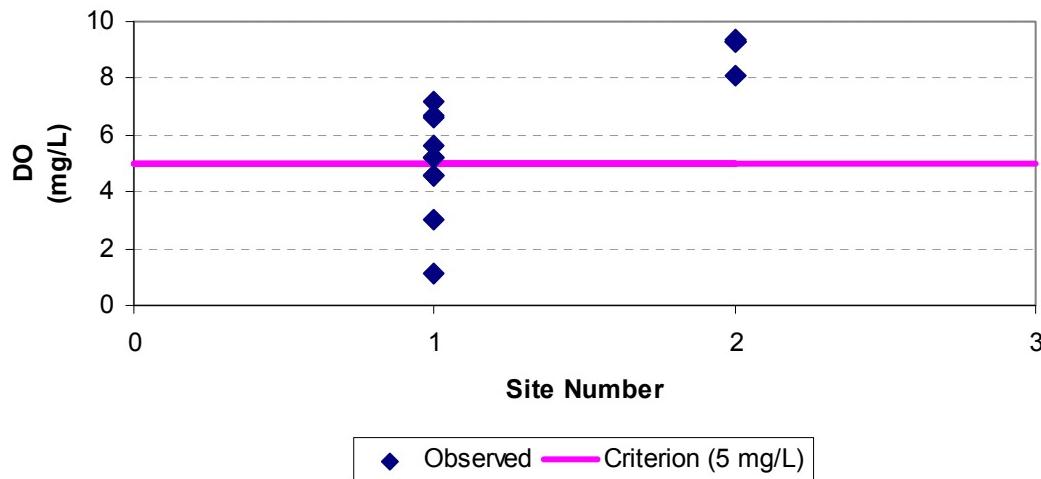


Figure 1

***E. coli* Data for East Fork Locust Creek for the 2006 and
2007 Recreational Seasons**

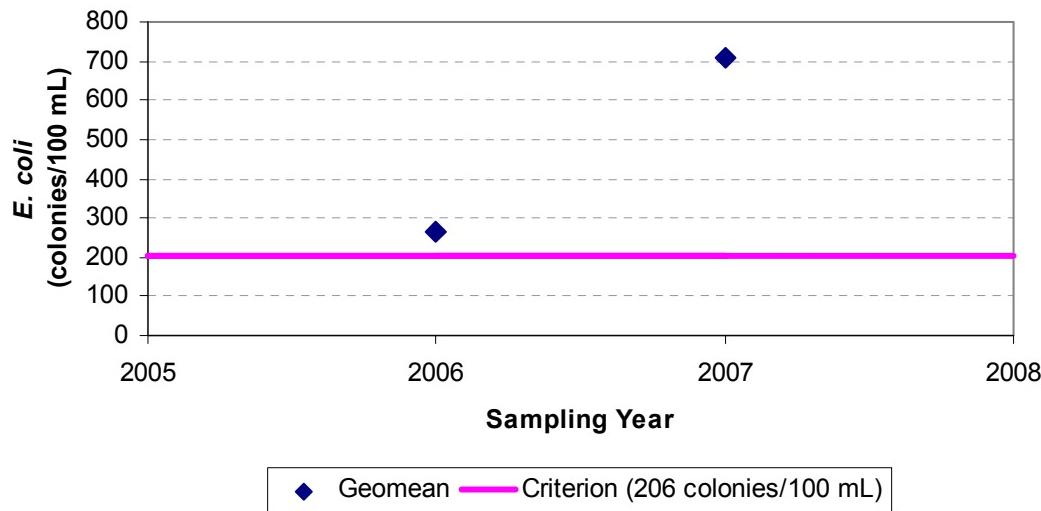
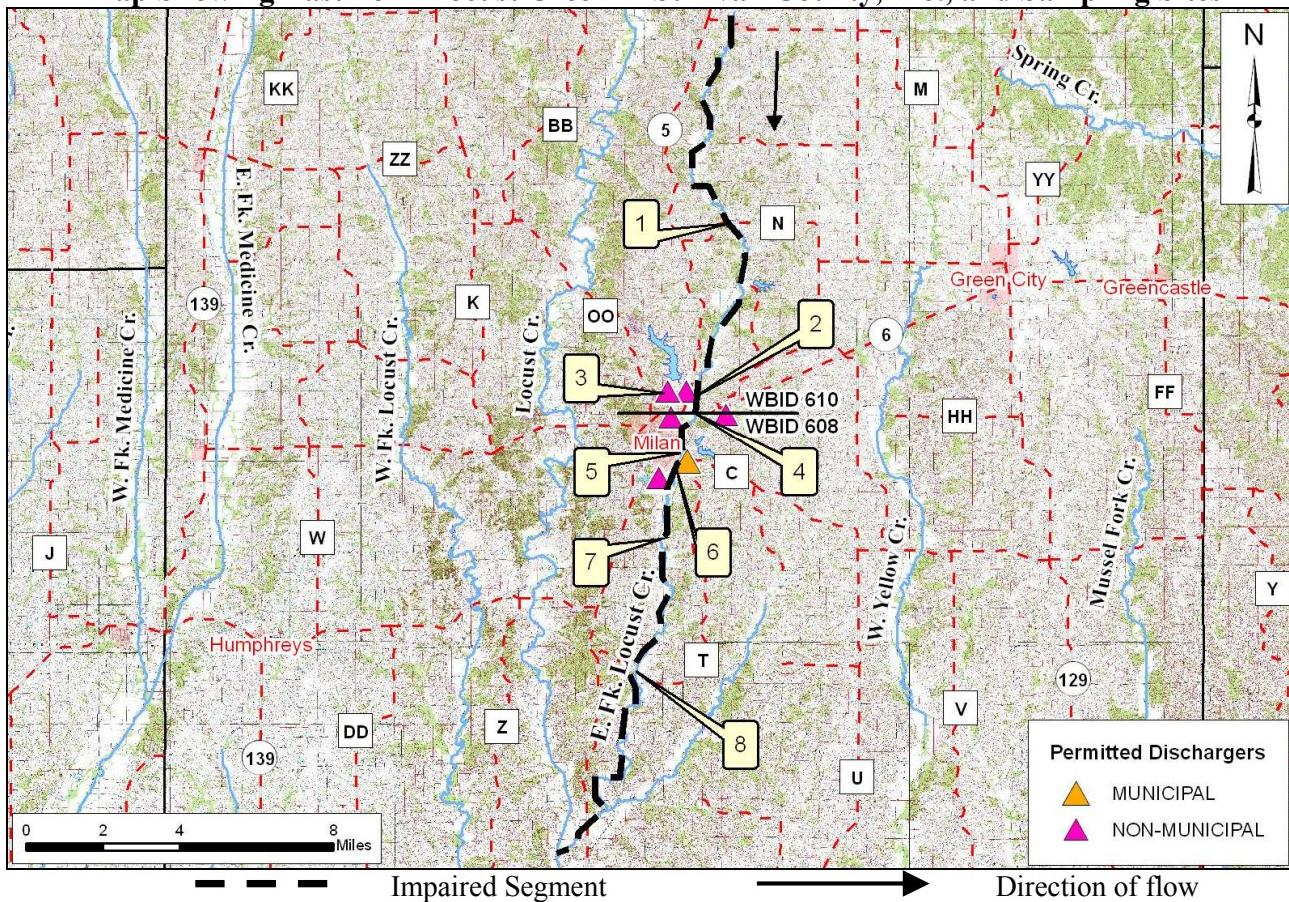


Figure 2

Map Showing East Fork Locust Creek in Sullivan County, Mo., and Sampling Sites



Sample Sites

- 1 – E. Fk. Locust Cr. at State Highway N
- 2 – E. Fk. Locust Cr., 30 yards above Elmwood Br.
- 3 – PSF Foods WWTP Outfall
- 4 – E. Fk. Locust Cr. at State Hwy 6, 1 mi. below PSF Foods
- 5 – E. Fk. Locust Cr. at State Highway C
- 6 – E. Fk. Locust 0.1 miles below Milan lagoon
- 7 – E. Fk. Locust Cr. 2.5 miles below Milan lagoon
- 8 – E. Fk. Locust Cr. at State Highway T

Note: PSF = Premium Standard Farms

For more information call or write:

Missouri Department of Natural Resources
 Water Protection Program
 P.O. Box 176, Jefferson City, MO 65102-0176
 1-800-361-4827 or 573-751-1300 office or 573-522-9920 fax
 Program Home Page: www.dnr.mo.gov/env/wpp/index.html